

### **REMARKS/ARGUMENTS**

These Remarks are responsive to the Office Action mailed March 28, 2005 ("Office Action"). Applicants respectfully request reconsideration of the rejections of claims 1-26 for at least the following reasons. The Office Action has been reviewed, and in view of the foregoing amendments and following remarks, reconsideration and allowance of all of the claims pending in the application are respectfully requested.

#### **Drawings**

The drawings have been amended as requested by the Office Action. More specifically, the terms STUR and STUC of Figures 1b and 1c have been corrected to correspond to the detailed description. Figures 8 and 9 are identified separately. Figures 10 and 11 are identified separately. Figures 21 and 22 are identified separately. Accordingly, the drawing objections should be withdrawn.

#### **Specification**

Specification has been amended to include definitions for G.SHDSL and PAM.

In addition, "Claims" has been replaced with "We Claim."

The Office Action also requested that the aspects of the present invention be specified in numerical order. Applicants request clarification and further explanation as to the objection. In addition, Applicants request the relied upon authority requiring that the aspects of the present invention to be in numerical order.

#### **Claim Objections**

The claims are objected to based on minor informalities. The claims have been amended as suggested by the Office Action to overcome the minor informalities. No new matter has been added.

**Claim Rejections - 35 U.S.C. § 112**

Claims 1-27 are currently rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter.

The Office Action notes that the second modem is not recited in the body of the claims. Claims 1 and 14 have been amended to include “the second modem” in the body of the claims.

The Office Action asserts that claim 6 is vague and indefinite because of the phrase “a plurality of modems.” Claim 6 has been amended to clarify “the first modem and the second modem.”

The Office Action further alleges that the phrase “the steps” lacks antecedent basis. Claim 1, line 3 recites “the steps” as being the steps specified in the body of the claim. Therefore, “the steps” as recited in claims 6, 12 and 13 refer to the steps defined in claim 1. Applicants assert that the claim language clearly defines the invention. However, if the Examiner disagrees, further clarification of the rejection is respectfully requested.

The terms “G.SHDSL” and “PAM” have been defined through the amendment to the specification above.

The Office Action further alleges that the phrase “the estimate of channel capacity for a plurality of rates of interest” is unclear. Applicants submit that page 22, line 1-3, recite that “[t]he geometric capacity may be computed to find a single number that may be compared between rates to determine an optimal (or best) rate of transmission.” Therefore, the estimate of channel capacity refers to the capacity computed for a rate of interest which may be compared to estimates for other rates of interest. Applicants assert that the claim language clearly defines an aspect of the invention.

It is believed that the claim rejections have been overcome through these clarifying amendments. No new matter is added with these amendments.

**Allowable Subject Matter**

Applicants appreciate the indication of allowable subject matter of claim 27. However, Applicants believe the independent claims are patentable over the applied prior art. Therefore, reconsideration is earnestly requested in view of the foregoing amendments and following remarks.

**Rejection under 35 USC 102(e)**

Claims 1-26 are rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 5,475,711 to Betts *et al* (“Betts”). Applicants respectfully disagree. Betts purports to show a system for channel capacity modulation where an analog modem is configured for identifying the optimum bandwidth and maximum data rate for use over a selected bandwidth-constrained channel.

The claimed inventions are directed to determining a data rate using sub-band capacity. More specifically, independent claims 1 recites a combination of “receiving a signal from the first modem;” “determining from the signal, information concerning line conditions on the communication channel associated with the first modem;” “calculating an estimate of channel capacity using a geometric mean of capacities of a plurality of frequency domain sub-bands *wherein each sub-band is sufficiently small such that noise within the sub-band is approximately additive white and gaussian noise;*” and “determining the data rate based on the estimate of channel capacity.” Independent claim 14 recites similar limitations. These combinations of claim limitations are not disclosed by Betts.

For example, the Office Action relies upon Betts’s SNR circuit 200 that performs a

frequency dependent noise spectrum analysis from which frequency domain information of the noise signal is output. Betts fails to provide any disclosure that is directed to *calculating an estimate of channel capacity using a geometric mean of capacities of a plurality of frequency domain sub-bands*. The SNR circuit 200 of Betts fails to calculate an estimate of channel capacity of a plurality of frequency domain sub-bands. For original claims 5 and 18 which are now recited in independent claims 1 and 14, respectively, the Office Action relies upon Bett's discussion of the effects of a non-white noise source injected into the channel between the transmitter of the transmit modem and the receiver of the receive modem. However, this disclosure fails to show the limitation that recites "*wherein each sub-band is sufficiently small such that noise within the sub-band is approximately additive white and gaussian noise.*" The discussion relied upon by the Office Action does not apply to an estimate of channel capacity of a plurality of frequency domain sub-bands. In fact, it is completely unrelated to defining a sufficiently small sub-band as claimed by Applicants.

Under 35 U.S.C. § 102, the Patent Office bears the burden of presenting at least a prima facie case of anticipation. Anticipation requires that a prior art reference disclose, either expressly or under the principles of inherency, each and every element of the claimed invention. In addition, the prior art reference must sufficiently describe the claimed invention so as to have placed the public in possession of it. In this case, as discussed in detail above, the Office Action has failed to show that Betts discloses each and every claim limitation recited by Applicants. Therefore, the Office Action has failed to meet its burden. The rejection of claims 1-26 under 35 U.S.C. § 102(b) should be withdrawn and the claims allowed accordingly.

Claims 2-4, 6-13, 14-17 and 19-26 all depend ultimately from one of independent claims 1 and 14. As such, each of these dependent claims contain each of the features recited in the

independent claims. For the reasons stated above, Betts fails to disclose the claimed inventions and the rejections should be withdrawn. Additionally, these claims are separately patentable over Betts.

**CONCLUSION**

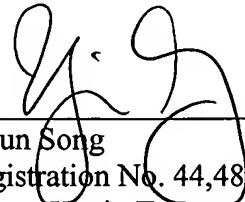
In view of the foregoing amendments and arguments, it is respectfully submitted that this application is now in condition for allowance. If the Examiner believes that prosecution and allowance of the application will be expedited through an interview, whether personal or telephonic, the Examiner is invited to telephone the undersigned with any suggestions leading to the favorable disposition of the application.

It is believed that no fees are due for filing this Response. However, the Director is hereby authorized to treat any current or future reply, requiring a petition for an extension of time for its timely submission as incorporating a petition for extension of time for the appropriate length of time. Applicants also authorize the Director to charge all required fees, fees under 37 C.F.R. §1.17, or all required extension of time fees, to the undersigned's Deposit Account No. 50-0206.

Respectfully submitted,

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**Amendment to the Drawings**

Replacement sheets to Figures 1b, 1c, 8, 9, 10, 11, 21, and 22 are attached herewith as Appendix A.

Figures 1b and 1c have been amended as suggested by the Office Action. More specifically, STUR and STUC have been corrected to correspond to the detailed description.

Figures 8 and 9 are identified separately.

Figures 10 and 11 are identified separately.

Figures 21 and 22 are identified separately.